UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Informational Memo

Subject: Invasive News in a Nutshell #18:
Covering August-November, 2007

From: Joan Cabreza
Regional Invasive Species Coordinator

To: R10 ETPA Management Team
ecc: Internal EPA mail group & interested outside parties

These memos originated in 2003 to update EPA Region10 management on EPA invasive species program activity, but readership has expanded so greatly that I have expanded the content to provide more universal interest, although there is still a strong US Pacific Northwest and special EPA focus. Credit for any errors is entirely mine. For comments or contributions, or to subscribe or unsubscribe, email me at <cabreza.joan@epa.gov>.

This Quarter's Off-The-Wall Factoid

At least two people have been killed while working on nutria (see previous *Nutshell* issues) but now milfoil has claimed a victim. In August, a 22-year-old man died when he apparently became entangled in a thick bed of milfoil *(Myriophyllum spicatum)* in the Columbia River. Police say the man was visiting the area with three friends when they decided to go for a late-night swim in the river near the Kennewick boat launch, in southeast WA. The man apparently was not a strong swimmer and drowned when he got caught in the milfoil. Milfoil currently infests a large number of WA rivers and lakes. *(From an Associated press article, 8/26/07)*

EPA Activities

Western (U.S.) Rivers Study: Results of a an Environmental Monitoring and Assessment (EMAP) study by researchers from OR State U and EPA found that more than half of the stream and river miles surveyed in 12 western states contained non-native fish and amphibians. 1361 sites were sampled between 200-2004 in three large-scale ecoregions (mountains, plains and xeric), and from 30-33 non-native species were found in each ecoregion. The largest number of nonnative species was found in CA (26) and the fewest in ID (4). The entire paper "Distribution of Nonnative Aquatic Vertebrates in Western U.S. Streams and Rivers" is published in the North American Journal of Fisheries Management 2007 (27:1082-1093) and it is also available online at [Http://afs.allenpress.com/perlserv/?request=get-toc&issn=1548-8675] *(Thanks to Gretchen Hayslip, EPA R10)*

EPA Ballast Water Lawsuit (recap and update). This has dragged on so long, a recap may be in order. In January 1999, citing invasive species concerns, a number of interested parties petitioned EPA to repeal its long-standing regulation at 40 C.F.R. 122.3(a) excluding ballast water and other incidental discharges from Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) permits. In September, 2003, EPA denied the petition, and in December, 2003, several groups filed a lawsuit. On March 30, 2005, the District Court ruled that the EPA exclusion exceeded the Agency's CWA authority, and on September 18, 2006, the Court issued an order vacating (revoking) the regulatory exclusions and requiring that by September 30, 2008, those discharges previously excluded from NPDES permitting by the regulation will become prohibited unless covered under an NPDES permit. EPA filed a notice of appeal with the Ninth Circuit Court on November 16, 2006, and provided oral arguments to the court on August 14, 2007. As of today (December 5), there has been no response yet.

The NPDES permit exclusion was been in place since 1973, and the decision potentially implicates all vessels, both commercial and recreational, that have discharges incidental to their normal operation (e.g., deck runoff, graywater, etc). There are 13 *million* State-registered recreational boats, 81,000 commercial fishing vessels, and 53,000 freight and tank barges operating in U.S. waters and over 25 different types of vessel discharges could be affected by the decision. Given the deadline, EPA is now exploring options, including establishment of an appropriate permitting program. To assist in this, EPA issued a Federal Register notice on June 21, 2007, requesting information on vessels and their discharge characteristics as well as potential technologies and practices for discharge control. The comment period ended August 6, and the approximately 1,600 comments received are now being evaluated. *Related documents are available at [http://www.epa.gov/owow/invasive_species/ballast_water.html]. For more information, contact <cooper.ruby@epa.gov>.*

Climate Change and Aquatic Invasive Species Report**:** The EPA report *Effects of Climate Change on Aquatic Invasive Species and Implications for Management and Research* is now posted on the EPA website. It incorporates the results from national workshops held in Washington DC in June and October, 2006. *Access it at http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=180043#Download (Thanks to Britta Bierwagen, EPA HQ.)*

Global Climate Change Research Report. The new *Summary of NHEERL Ecological Research on Global Climate Change* reports on 14 years of research conducted by the EPA ORD at its National Health and Environmental Effects Research Laboratory (NHEERL) facilities. Edited by Dr. Peter Beedlow and Dr. David Tingey, this research compendium presents findings on how global climate change may affect terrestrial, freshwater, and marine ecosystems, as well as agriculture. The research described in this report has augmented the understanding of potential effects of global warming and rising levels of atmospheric carbon dioxide on natural and managed ecosystems. Find the report at: [http://www.epa.gov/wed/pages/publications/authored/GCC_report_web.pdf] (*Thanks to Roseanne Lorenzana, EPA R10.)*

Integrating Aquatic Invasives and the Clean Water Act (CWA). EPA has developed a cooperative agreement with the Environmental Law Institute to conduct research on how states are integrating aquatic invasive species with other ongoing activities under the CWA. It is exploring things such as possible integration with water quality assessments, water quality standards, stream listings, and Total Maximum Daily Loads. (For more information on this project see Nutshell issue #16). R10 provided draft review, and the report is scheduled for release soon. (*For more information, contact Christine Ruf, at <Ruf.christine@epa.gov>.)*

News From The Pacific Northwest

New Ballast Water Research Facility. Pacific Northwest National Laboratory (PNNL) has been awarded a $1.25 million grant from NOAA and USFWS to construct a facility to aid in ballast water treatment. The Research, Development, Testing and Evaluation (RDTE) facility will be built at the PNNL Marine Science Laboratory in Sequim, WA. The facility will be ready to begin testing technologies to treat ballast water on board ships in early 2009. U.S. Coast Guard and WA regulations will allow only certified technologies that have undergone rigorous testing to be used on ships making calls in US Ports. The Sequim facility will be the second such facility for commercial testing in the country; the other facility has recently come on-line in Duluth Minnesota. Protocols and equipment testing to help determine appropriate ballast water RDTE designs have been developed by the Naval Research Laboratory in Key West Florida. PNNL is a Department of Energy's multi-program science laboratory, managed by Battelle Memorial Institute, based in Columbus, OH. *(Thanks to Andrea Copping, PNNL)*

Columbia River ANS Study. Portland State University has recently completed the final report for the Middle Columbia River and Lower Snake River ANS survey (MCRANS). This study, funded by USFWS, follows an original inventory of the lower Columbia River done in 2004, to provide baseline data for evaluating management of ballast water and other pathways. The MCRANS study documented 50 nonnative aquatic species in the focus area (likely a conservative number) as opposed to 81 found in the lower Columbia. See the complete report at [http://www.clr.pdx.edu/publications/] *(For more information, contact Mark Sytsma, at < sytsmam@pdx.edu>.)*

ABWEA Workshop Proceedings Now Available. Meeting presentations and Proceedings of the "Workshop on Alternate Ballast Water Exchange Areas: Physical and Biological Oceanographic Considerations" that was held last year in Seattle, are now available at [http://www.psmfc.org/ballast/past_meetings.html.] (*Thanks to Stephen Phillips,PSMFC)*

Seattle's Port is a Pathway. The Port of Seattle has recently stopped shipments of building materials from India and China containing a variety of dangerous pests. On October 1, on unloading a container containing slate, granite and tiles from China, U.S. Customs and Border Protection agents inspectors found two adult snails, the first of their kind to be intercepted at a U.S. port of entry. After fumigation, the shipment was allowed to proceed. A second container of slate from the same company in China contained snails and the larvae of wood wasps, long-horned beetles, and bark beetles in the wood packing

material. On October 22, agents sent back a container of tractor parts from India, packed with material which contained bark beetles and pinhole bark borer weevils. All of these pests could pose a risk to U.S. agriculture. *(Thanks to the Jim Gores, ODFW.)*

Invasive Species Article Series: The Statesman Journal has begun a 9-month media series on invasive species in OR. The series on the environmental and financial effects of invasive species in OR began on September 23, 2007, and continues through June. The series will offer monthly explorations of different invasive species and their effects on the state. Visit the site at [www.InvasiveSpeciesofOregon.com] *(Thanks to Jeff Adams, UW)*

Warm Springs Tribal Weed Eradications. Wasco and Jefferson counties in OR are finishing their herbicide treatments for the 2007 season. They have treated an estimated 250 acres and surveyed close to 3500 acres for the Warm Springs Reservation. Funding from seven sources was used to survey and treat a variety of weeds, including leafy spurge, yellow flag iris, knapweed complex, tansy ragwort, hounds tongue, Canada thistle, toadflax, diffused knapweed, knotweed, and Scot's broom. (*Thanks to Bill Reynolds, CTWS)*

USFWS Outreach Project (Update). USFWS has formed an interagency group to develop two invasive species education modules to assist speakers with invasive species presentations. The first module is basic and discusses invasives in general, with a "why should I care" focus and a core message of biodiversity loss. The second module is a species-based module (featuring knotweed), that should be able to be used as a template for other species modules. The goal is to have the first module developed by February. (*For more information, contact <Douglas_zimmer@fws.gov>.)*

WA Invasive Species Council (update). The Council has been meeting for about a year, and we are now working on the state strategic plan, which is due to the Legislature in June, 2008. Five workgroups are developing the major themes in the plan. The next meeting will be held January 23, 2006. *Meeting minutes, council members, and other information on the Council are available on the new website at: [http://www.rco.wa.gov/invasive_species]*.

ID Invasive Species Council (Update). The *ID Aquatic Nuisance Species Plan: a supplement to Idaho's strategic plan for Invasive Species,* was approved by the national Aquatic Nuisance Species Task Force at the November meeting. An interagency Idaho Aquatic Nuisance Species taskforce has also been established, and we will hold our first meeting in January. The taskforce will serve as a technical advisory group to the state Invasive Species Council on ANS issues. The ANS plan can be found on-line at: [www.anstaskforce.gov/ State%20Plans/Idaho_ANS_Plan_2007.pdf]. (*For more information on the task force, Contact Tom Woolf at twoolf@agri.idaho.gov.)*

WA ANS Committee (update): The Committee has released a "Watch List" of invasive species for WA, that lists organisms the committee feels generally have detrimental impacts on the environment. It also prioritizes them into two categories, which is hoped will facilitate response actions and other management issues. We are now working on

rules for an orderly method of list additions/deletions. (*For a copy of the watch list or for more information on the ANS committee, contact me at: <cabreza.joan@epa.gov>.)*

OR "Most Dangerous Invaders" List. The OR Invasive Species Council has just released the 2007 list of the "100 Most Dangerous Invaders". Unlike the WA list, which is education and management focused, the Oregon list contains a large number of microorganisms, and it is used more as a "success indicator" to track how well the state is able to prevent new things from establishing in the state. (*Find the list at: [http://www.oregon.gov/OISC/most_dangerous.shtml].)*

WA Aquatic Invasive Species Permit. (Update). Ecology has begun developing a general permit to allow the rapid chemical treatment of invasive species such as zebra mussels, spiny water fleas, and marine tunicates. The permit will cover non-native invasive aquatic animal and marine algae control activities that result in the discharge of chemicals and other control products into WA fresh, brackish, marine, and estuarine waters. This permit does not cover maintenance and operation activities at facilities potentially impacted by well-established invasive animal species. Ecology accepted comments on the new Aquatic Noxious Weed Permit through November 14. The draft permit is available at: [http://www.ecy.wa.gov/programs/wq/pesticides/index.html] (*For more information, contact Kelly McLain at <kelm461@ecy.wa.gov>).*

WA Freshwater Algae Control Program (Update). The algae control program is now up and running (See previous Nutshells for more info) and Ecology has been receiving a large number of water samples. There have been toxicity events that even include dog deaths. One point of interest is that algal blooms are still occurring, and toxins are still being produced, even this late in the season! See the new website for this new program at: [http://www.ecy.wa.gov/programs/wq/plants/algae/monitoring/index.html]. *(For further information on the new program, contact Kathy Hamel <kham461@ecy.wa.gov.)*

Columbia River Carp Risk Assessment. The USFWS is working on a report addressing the potential for introduction and establishment of Asian carps to the lower Columbia River Basin. The report is titled*: Columbia River Basin Asian Carps Risk Evaluation,* and should be available online by spring, 2008. *(For more information on the report, contact Kevin Aitkin < Kevin_aitkin@fws.gov>.)*

Atlantic Salmon Risk Assessment**:** "Assessment of the risk of invasion of national forest streams in the Pacific Northwest by farmed Atlantic salmon" (Gen. Tech. Rep. PNW-GTR-697) is available from the Portland, OR, USFS. The report describes the evidence of Pacific Northwest stream invasions by Atlantic salmon (*Salmo salar*) that have escaped from marine salmon farms, and assesses the potential impact of farmed salmon invasion on native fishes on National Forest lands. The report indicates the current risk to streams on National Forest lands in the Pacific Northwest from Atlantic salmon invasions appears to be low, and limited to a few areas in northwest Washington and southeast AK. However, it indicates long-term risks may be substantial if fish continue to escape from marine rearing pens or freshwater hatcheries. The two greatest threats appear to be that (1) Atlantic salmon could transmit a serious disease or parasite to native fishes, and (2) escaped salmon could eventually adapt to local conditions, leading to self-sustaining

populations. If Atlantic salmon populations are eventually established, this species' preference for swiftly flowing stream habitats could facilitate competition with currently at-risk species such as steelhead (*Oncorhynchus mykiss*). This could result in a pattern of expansion similar to that observed in other nonnative aquatic plants and animals, where a prolonged early colonization period is followed by a rapid phase of exponential growth as breeding populations adapt to local conditions. *(To obtain the report, go to [http://www.treesearch.fs.fed.us/pubs/25130]; (Thanks to Kevin Aitkin, USFWS.)*

ANS Guide to the Columbia Basin (Update). The OR Sea Grant field guide, *On the Lookout for Aquatic Invaders; an Identification Guide for the Pacific Northwest* is completed, and Sea Grant is now exploring options for funding printing of the booklets and CDs. This 60 page booklet describes 28 freshwater, riparian and marine plants and animals found in the Columbia Basin. Each species is described with great pictures, accompanied by a discussion of the background, distribution, spread mechanism, impacts, and habitat. The guide's purpose is to help community groups increase their understanding of aquatic invasive species and to stimulate monitoring efforts for species of most concern in their watersheds. The guide will be spiral bound, on waterproof paper, to facilitate use in the field. *(For more information, contact Sam Chan <samuel.chan@oregonstate.edu>)*

WA Ballast Water Inspections. WDFW has conducted about 160 ballast water inspections in the north Puget Sound. Now a new ballast water inspector has been hired who will concentrate on the Columbia River and south Puget Sound. WDFW indicates 15-17% of the vessels have no reporting forms, and that ballast water exchange is generally not effective, with significant coastal species remaining, regardless of the exchange method. *(For more information on the WDFW program, contact Allen Pleus <pleusaep@dfw.wa.gov>.)*

Education Kit Development. OR and CA Sea Grant programs are developing an aquatic invasive species /ballast water education lit to assist teachers and communicate invasive species information. The curriculum is aimed at age 9 to adults. The kit will have lessons on pathways, HACCP, impacts, resource guides and similar information. (*For more information, contact Sam Chan < Samuel.chan@oregonstate.edu>.)*

Clean Your Boat Awareness. Last month, the Puget Sound Partnership contracted with the ECO Resources Group to prepare a two-year education and outreach program on invasive species. The program will build awareness of marine invasive species, and encourage boat-related industries and boat-owning public to adopt practices that stop the spread of invasive species. This work will support WDFW's efforts to contain and control invasive tunicates in Puget Sound. A report will discuss how best to dopvelail/complement/supplement other awareness activities already in progress. *(For questions, or to provide input, ideas, concerns, etc. regarding the project, contact Cara Cruickshank < ecosolutions3@juno.com>.)*

Pacific Northwest Invasions

Quagga Mussels: Since the CA Department of Fish and Game (CDFG) reported the discovery of quagga mussels in Lake Mead and Lake Havasu on January 6, there has been a flurry of activity!

The Invasion Spreads. The number of new populations found is rapidly increasing. Mussels have now reached Hoover Dam, and they have been found in Lake Mojave, San Vicente, Lake Matthews, Lake Skinner, Dixon Reservoir and elsewhere. A population of veligers (but no adults) has also been found in Lake Powell. There is no reason to assume the mussel will not continue its spread throughout the southwest, but everyone is doing their best to slow the spread.

Aqueduct Closure. In July, the 244 mile Colorado River Aqueduct was shut down for ten days to dry out several portions to inspect for adults and kill smaller hard-to-see mussels. Literally billions of dollars have been spent zebra and quagga mussel control in the Midwest, and no doubt the aqueduct expenses are just the beginning of continuing mussel-related expenditures in the west. *(Thanks to Stephen Phillips, David Britton and others.)*

Check Stations. Continuously operated boat check stations have been instituted on several highways in CA and AZ, and CA game wardens and other staff now check all vehicles towing watercraft. Out of the 15,000 boats inspected since last January, 675 were found to contain quagga mussel larva and adult mussels.

Mussel-sniffing Dogs. CDFG has begun training dogs to sniff out quagga mussels on boats and trailers. A trained sniffer costs between $8-$12,000, and another $6,000 a year to maintain, but it is estimated that using dogs to search for invasive species can save the department about 800 work hours a year. CDFG hopes to train six dogs by the end of the year, and a total of 22 in the next three years, at an estimated cost of $250,000. Funding comes partly through the general fund, and partly from donations through CalTIP, a nonprofit group that encourages citizens to report polluters and poachers. *(Exerpted from an October 25 Sacbee.com article by Ngoc Nguyen; Thanks to James Gores, ODFW.)*

Columbia Basin Zebra/Quagga Mussel Response Exercise: On October 23-24, executive-level representatives and invasive species experts from over 20 agencies and organizations participated in a unique table-top exercise of the existing zebra/quagga mussel rapid response plan for the Columbia Basin. A primary goal of the exercise was to evaluate the response organization scheme recently incorporated into the working draft plan and derived from the National Incident Management System (NIMS) and the associated Incident Command System. The participants were trained on NIMS principles, and then worked through a scenario assuming live quagga mussels were discovered at a Washington boat ramp on the lower Columbia River. The exercise generated many valuable suggestions for revising the existing plan, and confirmed that the basic organizational approach was appropriate. It also helped bring home the

realization of the potentially large breadth of implications from an invasion. The draft response plan is now undergoing revision, and participants recommended a follow-up exercise in 2008 to continue building working relationships and refining response strategies. The next Columbia River Basin team meeting will be held February 26, in Vancouver WA. *(For more information on the plan and other 100th Meridian activity, go to: [www.1oothmeridian.org].*

WA Issues First Zebra Mussel Citations. Zebra mussels have been prohibited in WA since 2002. But now that quagga mussels (same genus as zebras) have reached the western states, WDFW enforcement officers are taking stronger action against contaminated vessels, and in November they shifted from warnings to issuing citations. The state's first citations for illegally transporting zebra mussels were issued to two out-of-state trucking companies hauling large boats from Iowa and Ontario, Canada, to the Pacific coast. WA State Patrol officers inspecting commercial vehicles at a weigh station east of Spokane found live zebra mussels attached to the boats being transported. WDFW issued the trucking companies gross misdemeanor citations for unlawful importation and transportation of prohibited aquatic animals, and arranged for decontamination of the boats at marine facilities on the coast. Citations can result in fines up to $5,000. *(For more information on the WDFW enforcement program, contact Eric Anderson at <andereca@dfw.wa.gov>.)*

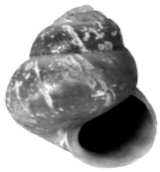
100th Meridian Initiative: A national meeting of the 100th Meridian Initiative was held in Las Vegas in late November, 2007. This meeting provided an opportunity for the program's various river basin teams to exchange information and develop joint strategies for implementing the program throughout the West over the next decade. Much of the discussion focused on lessons learned and implications of the western invasion of quagga mussels discovered in January this year. Notes from the meeting, and a list of resulting action items will be posted soon at: [http://100thmeridian.org/].

West Nile Virus in ID. In 2006, Idaho was hit with West Nile Virus harder than any other state. But overall, in 2007, there were significantly lower numbers of human cases *reported* for West Nile Virus in southeastern Idaho than there were in 2006. In 2006, there were 996 human cases reported statewide; as of November, 2007, only 108 cases were reported. Within the jurisdiction of SE District Health Department, in 2007, all 8 counties had West Nile Virus activity of some form or another (positive mosquito pools, other mammals, humans), including 14 human cases reported. Five counties reported positive mosquito pools; and cases in a llama, horse, and a dog were also reported. For more information, check out the ID Department of Health and Welfare's West Nile website at: [www.healthandwelfare.idaho.gov/site/4278/default.aspx]. *(Thanks to Ed Marugg, IDHW, and Sue Skinner, EPA R10)*

New Zealand Mudsnails in BC. Canada Fisheries and Oceans reports that New Zealand mudsnails (*Potamopyrgus antipodarum*) have been positively identified in a small ephemeral creek and surrounding estuarine intertidal area at the head of Alberni Canal near the Somass River on Vancouver Island. They were very abundant in the creek and less so in the estuary (salinity 6 ppt). The invasion area appears to be small, and from a recent introduction, most likely via recreationalists with contaminated gear. The nearest

known North American infestation is at the mouth of the Columbia River, but the snail has been reported in all western states except NM. The snail reproduces quickly and reaches densities up to 500,000 per m^2, leading to concern that such large numbers of herbivorous grazers could impact the food chain of native species and alter their habitat. *(Thanks to Gary Caine, <gary.caine@gov.bc.ca>)*

New Estuarine Snail in OR.
(photo: Dr. James H. McLean, LA Museum of Natural History)



On July 5, a new snail invasion was detected in OR. The snail is currently identified as "*Assiminea*" sp. It likely comes from Asia, and was probably introduced by shipping. This estuarine, brackish-water snail was found by the "thousands" per square meter on emergent mud banks in an upper estuary slough of Coos Bay, in waters of about 10 ppt salinity. Lower, on submerged stones, it co-occurs with the exotic New Zealand mudsnail *(Potamopyrgus antipodarum)*. In the higher salinity waters of middle Coos Bay estuary, it is found both on supralittoral emergent shores and in salt marshes, where it co-occurs with native snails. The exact diet of "*Assiminea"* sp. is unknown, but it is likely a deposit-detrital feeder and microherbivore. It should be expected to compete with other snail populations at these densities, and perhaps displace or replace some native and introduced species. It may be more widespread in bays and estuaries along the coast. About 5 mm in height, it has bulbous whorls, a broad inner aperture lip, light yellow bands at the top and bottom of the body whorl in younger shells, and with a highly eroded shell as the animal matures (see photo). The snail should not be confused with the New Zealand mudsnail or the native *Assiminea californica, (* which is smaller, with less bulbous whorls, a narrow inner lip, and does not erode significantly as an adult). The native species also typically does not penetrate into very low salinity sloughs or occur in large, dense concentrations on supralittoral mud banks. But if you believe you have seen this species, call the invader hotline at 1-866-INVADER. *(Thanks to Jim Carlton, via Mark Sytsma, PSU)*

Amphibian Chytrid Fungus in WA. A primitive fungal group, Chytridiomycetes normally perform the essential function of decomposing chitin and keratin in dead organisms. In 1999, *Batrachochytrium dendrobatidis (Bd)* was identified as the first chytrid fungus to cause vertebrate mortality. It has now been identified globally as a major cause of amphibian declines, and is the only disease organism that to-date has been unequivocally linked to species extinction; about two thirds of the ~140 species of Neotropical harlequin frogs (genus *Atelopus*) are thought to be totally or functionally extinct as a result of this fungus. *Bd* was recently discovered in both of the only two species of endangered amphibians in WA, the Northern Leopard Frog (*Rana pipiens*) and the Oregon Spotted Frog (*Rana pretiosa*), and two of the three areas where Spotted Frogs remain in the state have undergone precipitous declines in egg mass counts from 2005-2007. *Bd* has been shown to be transmissible through the transfer of bait organisms

between states, and it also has the potential to be spread via fish stocking. It is carried largely asymptomatically by the invading American Bullfrog (*Rana catesbeiana*). A hypothesis is currently being tested that the fungus is a clonal variation of a non-pathogenic form infecting African clawed frogs, which were used for pregnancy tests in the 1930s and 1940s. *(Exerpted from a summary provided by Marc Hayes, WDFW. For more info on the fungus, contact Marc at <hayesmph@dfw.wa.gov>.)*

WA Puget Sound Tunicate Activity (Update). The 2007 Legislature provided funding to the Puget Sound Partnership (formerly the Puget Sound Action Team) for tunicate management. The Partnership has entered into a $300,000 contract with WDFW to survey all of Puget Sound, develop a tunicate management plan, and research eradication methods. WDFW has developed baseline survey protocols and used commercial and agency divers and drop cameras to survey 25 marinas to date. A management plan will be completed by January, 2008. *(Thanks to Pam Meacham, WDFW)*

WA Port of Tacoma Mediterranean Snail Infestation.

In November, 2005, USDA and WSDA confirmed presence of a tiny terrestrial Mediterranean snail, *Cernuella virgata,* at the Port of Tacoma, in WA. It was suspected of arriving on a foreign container. This is only the second time the snail has been detected in the U.S., but it has been a major agricultural pest in Australia since the 1980s, causing millions of dollars in damage annually. Last July, a meeting was held to discuss a snail eradication plan, and in October, Ecology issued an Administrative Order temporarily modifying state surface water quality standards so WSDA can apply metaldehyde and/or iron phosphate controls. USDA believes the most effective way to eradicate the snail is to eliminate the snail's habitat by cutting brush and low-lying grass; applying bait to destroy the snail, and eliminating debris which provides snails with cover. Surveys revealed approximately 300 infested acres, but eradication is believed possible because the infestation is located on a peninsula surrounded on three sides by water. WSDA officials expect snail eradication efforts on the Tacoma Tideflats to take at least 3 years or longer, but expect to eradicate the pest by 2012. (*Summarized from a WDA fact sheet, with thanks to John Lundberg, WDA. For further information call the USDA office at 206-592-9057)* A News Tribune article (December 6) indicates 80 goats are being used to clear brush from the infested area. *(Thanks to Gen Dial, RCO)*

Viral Hemorrhagic Septicemia (VHS). Both the Western and Mississippi River Basin Panels on Aquatic Nuisance Species have asked the national Aquatic Nuisance Species Task Force to recognize VHS as an invasive species. Member states consider environmental consequences of this fish disease to be as significant as zebra mussels, and

both panels ask that states incorporate VHS management into their ANS programs. Fish shown to be susceptible to VHS infection include Atlantic salmon, brook and golden trout. *(Thanks to Kevin Anderson, PSP)*

Amur Goby (Update). The first amur goby (*Rhinogobius brunneus)*, population detected in North America last year still exists in the East Fork Lewis River in WA. An additional Amur goby was later collected by ODFW in 2007 in the original LaCenter site, and isolated specimens have now been collected near the mouth of the Sandy River in NW Oregon, and in the Ramsey Wetland in NE Portland, which is connected to Columbia Slough and the Willamette River, in OR.. This distribution suggests there is still an established population, but the extent and original source remains unknown. USFWS has entered into an agreement with the USGS Western Fisheries Research Center to develop a monitoring strategy for Amur goby and implement that strategy in the lower Columbia River next spring. *(Thanks to Paul Heimowitz, USFWS)*

National Activity

National Invasive Species Legislation (once again). A number of invasive species bills are still in congress. Two bills seem to hold the most promise: S1578, the Ballast Water Management Act of 2007, and HR2830 (title 5), the USCG reauthorization bill. There are 7 other bills in Congress, but they are still not out of committee. S1578 strengthens the existing national ballast water management program for aquatic nuisance species, including uniform, mandatory national standards for ballast water treatment. It limits states' abilities to regulate BW and also states that NISA, not the CWA, is the main authority for aquatic nuisance species in ballast water and other vessel-related vectors. Something will probably need to happen by end of January, if the bills are going to go anywhere this session. *(Thanks to John Lishman, EPA HQ)*

Ballast Water Treatment Standards and Testing Protocols. The USCG, with a number of cooperating agencies, is developing a draft programmatic Environmental Impact Statement (EIS) evaluating a range of potential national ballast water standards. The DEIS is undergoing clearance procedures now, and will hopefully be published next spring. After publication, three public meetings will be held across the country to obtain public comments on the alternatives proposed in the DEIS, and this will all lead to a Federal Register Notice of Proposed Rulemaking on a ballast water treatment standard. The Coast Guard is also partnering with the EPA Environmental Technology Verification (ETV) Program in Edison NJ, to finalize testing protocols for treatment technologies. Draft protocols developed in 2004 have been largely validated at the Key West, FL, facility and a pilot test was completed, but a few improvements still need to be added.

Nutria Management Plan. The national nutria workgroup has now formed a number of subcommittees and is holding monthly conference calls. Subcommittees include: Review of nutria in the US and worldwide; Basic Research; Rapid Response/control and eradication; Detection; Policy; and Economic impacts. The goal of the nutria work group is to provide a draft management plan to the ANSTF by fall, 2008.

A film crew from the Korean Broadcasting System also recently traveled to the US to prepare a documentary on ongoing efforts to eradicate nutria in the US. Korea also has a recently introduced (1999) and growing (>1000) population of invasive nutria and they are interested in containing the outbreak before it is out of control. The work we are all doing with nutria in the U.S. therefore has international importance, and it is an exciting time to be involved with nutria management. *(For more information, or to get involved, contact <Stephen.R.Kendrot@aphis.usda.gov>)*

Great Ships Initiative (GSI). The GSI is a multi-stakeholder effort managed by the Northeast-Midwest Institute and funded by a variety of US and Canadian ports and government agencies. Its mission is to accelerate the development of and use of effective treatment systems designed to minimize the presence of live organisms in discharge from ships ballast systems into the Great Lakes and elsewhere. GSI offers research services to assist the research and development process, such as answering questions on ecotoxicity, dose and treatment effectiveness, operational issues, etc. and is soliciting applications from ballast water treatment vendors. Costs will be largely underwritten by the GSI. GSI recently opened a facility in Superior, WI, to test various ballast water treatment technologies. The Universities of WI and MN participate in the testing at the GSI facility, and Seakleen™, a ballast water treatment system marketed by Hyde Marine, Inc., is the first such system to be tested. *(For more information on this initiative, go to [www.greatshipsinitiative.org].)*

Import Report. A Defenders of Wildlife (DW) press release has indicated "Federal agencies charged with overseeing the legal import of live animals across our borders are failing to take simple, inexpensive steps that could dramatically reduce the risks posed by these species to public health and the environment". Nearly one in seven non-native animal species legally imported into the US pose a potential risk to native wildlife, human health or domestic animals. The report, *Broken Screens: The Regulation of Live Animal Imports in the United States,* details proactive steps that federal agencies overseeing wildlife trade could and should take to reduce risk. It has been called the most detailed analysis ever done of this trade. After reviewing 2,241 non-native animal species that were intentionally and legally imported between 2000 and 2004, Broken Screens concludes that at least 302 of those species have potential to cause environmental disruption, economic harm or threats to human and animal health. Later this year, DW plans to convene a meeting of major stakeholders in the live animal trade to begin exploring collaborative solutions to the problems identified in the report. *(For the full report, or other background information, go to [www.defenders.org/animalimports] or [http://www.defenders.org/programs_and_policy/international_conservation/u.s._imports_of_live_animals/broken_screens.php])*

Weed-Free Forage on Forest Service Lands. A new requirement requiring use of certified weed-free straw and feed in Forest Service wilderness areas went into effect for Pacific Northwest forests, on January 1, 207, and on January 1, 2009, it becomes effective nationwide. Commercially processed feed pellets and steamed, rolled grains are considered weed-free feed because viable seeds are destroyed in the making of these products, so they aren't considered as a vector for spreading weeds. Those who bring in straw and hay may have to make some changes. There is no state-wide weed-free

certification program in WA, although county noxious weed boards will have the opportunity to receive training for certifying hay and crop products starting in 2008. Currently Pend Oreille County and several neighboring states including OR, ID, MT have the ability to certify weed-free hay. Check out the WA State Weed Board's FAQ page on weed-free forage at [http://www.nwcb.wa.gov/FAQs/weed-free.htm] for information on what is allowed. For more information, contact Alison Halpern at the State Weed Board <noxiousweeds@agr.wa.gov> or Steve Burke, at <steven-j.burke@kingcounty.gov>. (*Thanks to Sasha Shaw, KC*)

Genetically Engineered (GE) Bentgrass Settlement. On November 26, USDA announced a $500,000 civil penalty settlement agreement with The Scotts Company, for the accidental release of glyphosate-tolerant creeping bentgrass (*Agrostis stolonifera*) in OR. Creeping bentgrass was genetically engineered by the Monsanto Company, and is resistant to the herbicide glyphosate. Scotts has agreed to pay a civil penalty of $500,000, the maximum allowed by the Plant Protection Act of 2000. APHIS entered into this agreement to resolve allegations that Scotts failed to comply with performance standards and permit conditions for field trials of glyphosate-tolerant grass. Scotts is continuing monitoring and mitigation actions in central Oregon to locate and remove the materials accidentally released during the 2003 field trial. As a part of the settlement agreement, Scotts will conduct three public workshops for potential developers of genetically engineered plants and other interested parties. The workshops will focus on best management practices and technical guidance on identification and prompt resolution of biotechnology compliance incidents. *(Summarized from the USDA press release; for the full press release, go to [http://tinyurl.com/ynmmhg] (Thanks to Elaine Somers EPA R10, and several others)*

Michigan Ballast Water Lawsuit. In an important ruling, the federal court ruled that MI has the right to protect its waters by regulating ballast water discharges from ocean-going ships. The ruling found the shipping industries' claim that MI law violates the Commerce Clause to be invalid. The reason behind the ruling, in part, is that existing federal law (NANPCA and NISA), explicitly allows states to exercise their authority in this area. The decision holds precedent-setting implications for the other states with ballast water legislation pending. *(Thanks to Katherine Glassner-Shwayder, Great Lakes Commission, and Mike Letourneau, EPA R10)*

National Park Service Ballast Water Ban. The NPS has announced a ban on ballast water releases near Isle Royale, MI, hoping to keep the deadly fish disease VHS and other invasive species out of park waters. They also announced the installation of a ballast water treatment system on their 165-foot passenger ferry - **the first such system** on any Great Lakes-based ship. The new regulation is aimed at keeping Great Lakes freighters that motor through park waters from releasing ballast water that could contain invasive species, including viral hemorrhagic septicemia. The **ban is the first of its kind** by a federal agency on the Great Lakes and is in addition to MI law that requires permits and treatment from saltwater ships that release ballast water in state waters. The park regulation applies to saltwater ships from foreign ports as well as lakes. *(Summarized from a John Myers, Duluth News Tribune article- 09/18/2007)*

Black Carp Added to Lacy Act Listing**.** On October 18, 2007, the USFWS published a final Federal Register rule adding all forms of live black carp (*Mylopharyngodon piceus)* to the list of injurious fish under the Lacey Act. By this action, the Service prohibits the importation of live black carp, gametes, viable eggs, and hybrids into or between the continental United States, the District of Columbia, Hawaii, Puerto Rico, or any territory or possession of the United States. These organisms can be imported only by permit for scientific, medical, educational, or zoological purposes, or without a permit by Federal agencies solely for their own use. Interstate transportation permits may also be issued for scientific, medical, educational, or zoological purposes. The final rule became effective November 19, 2007.

ANS Taskforce Meeting. The National ANS Task Force met on November 7-8. Among other things, members approved a statement recognizing VHS and other pathogens as aquatic nuisance species. They encouraged the states to both consider VHS and other nonnative pathogens in their aquatic species management plans, and to develop targeted Hazard Analysis and Critical Control Point (HACCP) plans to address the spread within their states as appropriate. The Taskforce also approved the *Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States* and the *Idaho Aquatic Nuisance Species Management Plan;* and conditionally approved the Rhode Island and California Management Plans (pending Governor signatures). Minutes from taskforce meetings are available at [http://anstaskforce.gov/meetings.php] *(Thanks to Bettina Proctor, USFWS)*

New ISAC Members Sought. The National Invasive Species Council is appointing new members to the Invasive Species Advisory Committee (ISAC), and the Secretary of the Interior is requesting nominations for qualified persons to serve as members of the ISAC. Nominations must be postmarked by **January 14, 2008**, and sent to: Lori Williams, 1849 C Street, NW., Washington, DC 20240. (*For more information, check the November 30 Federal Register, page 67744.)*

ISAC Definitions Paper. The definition of invasive species can be important because there is often debate about what types of organisms are included. ISAC has developed a whitepaper that defines "invasive species" to provide a non-regulatory policy interpretation by identifying what is/is not meant by the term. *The paper is available at [http://www.invasivespeciesinfo.gov/docs/council/isacdef.pdf].*

National Management Plan Revision. The 2001 National Invasive Species Management Plan is undergoing revision. Agency comments have been submitted, and the plan is under review at OMB now; it is still unclear when it will be released. *(Thanks to Mike Slimak, EPA HQ.)*

Experimental Oysters Accidentally Released. **"**In July, a research team working on an experimental triploid non-native oyster (*Crassostrea ariakensis*) project in the Severn River, MD discovered that one of four treatment cages was damaged by a boat anchor in a no-anchor zone. Divers performed a search within 10m of the damaged cage finding 557 live triploids, but leaving 110 unaccounted for. Scientists suspect the remaining

oysters were either crushed by the damaged cage or buried too deep to survive. Analysis on the successfully retrieved samples suggests a very low probability that any unaccounted oysters could result in the establishment of a wild oyster population. However, this incident demonstrates the need to fully address, in the ongoing non-native oyster EIS, the fact that human error and accidents of this nature contribute to the risk of inadvertent escape and establishment of non-native oysters in the Bay." *(From the Chesapeake Bay Program Office Salient Issues, September 10, 2007.)*

Unexpected Effect of Katrina? A USA Today article on New Orleans has pointed out that the vegetation "threatens to finish off what Hurricane Katrina began". Abandoned residences and lack of lawn mowing to keep weeds under control are resulting in conditions that allow plant fragments and seeds brought in by floodwaters or blown in by winds to take over. The new vegetation developing does not necessarily resemble what was there before. Not surprisingly, vines seem to be particularly aggressive. (The article included pictures of a house all but covered in a vine.) *(From USA Today, Ben Harder.)*

Other New Publications and Materials

Launch of AQUATIC-ALIENS listserv. A new forum for marine, freshwater and terrestrial algae is open to all interested in algae. For anyone interested in the topic of non-native species, a new forum called AQUATIC-ALIENS has just been launched. This new forum can be used to post news items etc. of interest to people working in the area of aquatic (marine & freshwater) invasive species. To join, go to [https://listserv.heanet.ie/aquatic-aliens.html]

New Invasive Plant Journal. Manuscripts are currently being accepted for a new peer-reviewed journal on invasive plant science and management, to be published quarterly by Weed Science Society of America. Topics of interest include fundamental and applied research on invasive plant biology, and ecology, management, restoration, educational, sociopolitical and technological related aspects of invasive plant management. The first issue will be published in 2008, and will include papers on leafy spurge, pepperweed, and cogon grass. *For additional information, contact the editor, Dr. Joe DiTomaso, at <jmditomaso@ucdavis.edu>.*

Ballast Water Report. NOAA Technical Memorandum GLERL-142, "Current State of Understanding about the Effectiveness of Ballast Water Exchange (BWE) in Reducing Aquatic Nonindigenous Species (ANS) Introductions to the Great Lakes Basin and Chesapeake Bay, USA: Synthesis and Analysis of Existing Information", by Gregory Ruiz and David Reid, is now available. It examines the current state of knowledge about ballast water exchange (BWE) and its effects as applied specifically to the Great Lakes and Chesapeake Bay. They summarize the discovery rates and invasion patterns in both ecosystems, and evaluate BWE effectiveness by examining how it has likely affected propagule supply to the Great Lakes and the Chesapeake Bay. They also characterize past and present maritime shipping to the Great Lakes and Chesapeake Bay, and attempt to evaluate changes in propagule supply attributable to changes in shipping practices, in order to assess the likely effects BWE has had as a prevention strategy. The report

describes the effectiveness of ballast water exchange procedures as a way to reduce the amount of aquatic invasive species discharged into U.S. waters, and suggests that a standardized survey program targeting key US coastal ecosystems could provide the high-quality data necessary to assess current invasion risk. It could also help measure the performance of multiple management actions, including those of ships and other transfer mechanisms. *(For the report, go to [ftp://ftp.glerl.noaa.gov/publications/tech_reports/glerl-142/tm-142.pdf].)*

Kudzu: An "Ozone factory"?. Kudzu (*Pueraria montana*) was first introduced from Japan in 1876 as an ornamental. In the early 1900s, the government planted 100 million (!) plants for erosion control and along highways; it has now become a serious pest in warmer states, covering 3 million ha (7.5 million acres) of land. New research by Jonathan Hickman and Manuel Lerdau shows kudzu also adds large amounts of nitrogen compounds into the soil, water and atmosphere. Kudzu has long been known to be one of the leading plant sources of the hydrocarbon isoprene, which reacts in the presence of sunlight with oxides of nitrogen to form ozone. Kudzu roots also have soil-dwelling bacteria that turn atmospheric nitrogen into ammonia, which it needs to make chlorophyll. Kudzu leaf litter was found to contain nearly twice as much nitrogen as leaf litter from native tree species, and as leaves fall off and decay, they add nitrogen to the soil. The excess nitrogen may make it easier for other fast-growing invasive plants to take over, and rains may wash excess nutrients into rivers, causing algal blooms that deplete waters of oxygen and lead to fish kills. As soil nitrogen levels rise, so will emissions of NO and N2O. Since NO readily converts to NO2 in the atmosphere, it could also lead to spikes in low-level ozone. Initial findings show that NO fluxes from soil in invaded areas are twice those from uninvaded patches. Hickman has also found that kudzu causes small increases in emissions of N2O, which is 300 times more potent a greenhouse gas than carbon dioxide. "Kudzu is a little ozone factory," says researcher Lerdau. *(Thanks to Sabrina Ise-lovell, EPA HQ)*

Control Technology: The Super Sucker. Of the five exotic algae that now threaten Hawaiian reefs, only one arrived by accident—probably on a ship hull. The others were all brought in deliberately for aquaculture research in the 1970s, when scientists were evaluating the potential of various algae for commercial production, and they are now killing coral reefs, smothering sea grass beds, and fouling beaches in Hawaii. Each Super Sucker consists of a powerful pump and a 100-foot-long hose for suctioning algae onto the deck of a barge. Divers on the bottom shake loose any marine organisms that may be attached, and then feed in handfuls of algae. Workers on the barge further screen the collected algae for any accidentally collected marine life, and then pack the algae into bags for use as fertilizer. The Super Suckers can remove up to 800 pounds of algae per hour and restore hundreds of square feet of reef in a day. The Super Sucker project is a joint effort by The Nature Conservancy, the U of HA, and the HA Department of Land and Natural Resources. Studies have shown that in areas treated with the Super Sucker, native species can effectively prevent re-invasion, and new coral larvae begin to settle and grow. *(Paraphrased from the Discovery Channel 9/25/07). [Ed note: would this work on Puget Sound tunicates?]*

Phragmites australis. A non-native strain of *Phragmites* reed arrived in America via ballast water in the late 18th and 19th centuries. *Phragmites* roots create a thick, impenetrable mat in wetland substrates, and because it can grow very tall in a single season, it also shades out other plants, reducing wildlife food and habitat and changing the water flow and level within the marshes. New research by U. of DE scientists has shown that it appears to secrete an acid from its roots below the water line that destroys the roots of neighboring plants by changing their protein structure. The toxin, (3,4,5-trihydroxybenzoic acid, also known as Gallic acid) targets tubulin, a structural protein in the roots of competing plants. Once the root breaks down and the plant dies, *Phragmites* can spread without competition. Since its arrival, *Phragmites* has transformed the mid-Atlantic salt marshes, and now it is beginning to show up all around WA and other states as well. Until recently it was thought WA *Phragmites* was native, but genetic analysis has indicated that in King County, WA, at least, all of the infestations are nonindigenous.

Research indicates the exotic *Phragmites* is more invasive than the native form for several reasons: it emerges significantly earlier in spring, giving the exotic a longer growing season; the ratio of above- to below-ground biomass (weight) is much higher in the taller exotic, indicating a more efficient root/rhizome system or higher-quality reserves; the rhizomes of the exotic have longer spaces between the nodes, which may enable faster expansion of the exotic population; although native *Phragmites* has more buds per rhizome than the exotic form, the native buds remain dormant longer, resulting in the production of fewer shoots per rhizome when the canopy is damaged; leaf pigment concentration is greater in the exotic, allowing it to capture more of the sun's energy; and the roots of the exotic exude more gallic acid than do roots of the native *(Summarized from the News Journal, October 18, 2007; see the whole article at [http://www.msnbc.msn.com/id/21365483/from/ET/]*

Phragmites Brochure. The MI DEQ Great Lakes Office has released a brochure entitled "*A Landowner's Guide to Phragmites Control."* The invasive, non-native variety of *Phragmites australis* is a perennial wetland grass that grows up to 15 feet tall. It tends to create dense stands which crowd out native plants and animals, block shoreline views, reduce access for swimming, fishing, and hunting, and potentially create fire hazards from dry plant material. The guide was created to better demonstrate and communicate effective treatment methods and regulatory requirements to the public and resource managers. Download the guide from the DEQ web site (but you will need to do a search) at [http://www.michigan.gov/deqinlandlakes] *(Thanks to Tracy Mehan, Cadmus Group)*

Biocontrol document. The document "Biological Control of Invasive Plants in the United States" (USDA FS Publication FHTET-2002-04) is available online. A disk can also be ordered from: [http://www.invasive.org/eastern/biocontrol/].

Rapid Response Article. An article by Rejmanek and Pitcairn, "*When is eradication of exotic pest plants a realistic goal?"*, reviews the cost and probability of weed eradication success that illustrates the value of rapid response to new infestations. Review of eradication efforts indicated eradication of exotic weed infestations smaller than one hectare is usually possible, but only about 1/3 of infestations between 1-100 ha in size, and 1/4 of infestations between 101-1000 ha have been eradicated. Authors felt with a

realistic amount of resources, it is unlikely that infestations larger than 1000 ha (2500ac can be eradicated, although they should still be targeted for eradication, or at least control. Go to [www.issg.org/database/species/reference_files/TURTID/Rejmanek.pdf] to see the full article. *(Thanks to Mark Sytsma, PSU)*

EPPO. The European and Mediterranean Plant Protection Organization (EPPO) website has weed standards, databases and publications. The focus is, obviously, on Europe, but many of the publications have relevance elsewhere. For more information, visit the web page at: [http://archives.eppo.org/EPPOReporting/Reporting_Archives.htm], or contact Anne-Sophie Roy, the Information Officer, at <roy@eppo.fr>.

National Sea Grant Proposals. In October, NOAA Sea Grant requested proposals to fund research and outreach projects addressing the introduction and spread of aquatic invasive species. **February 14, 2008**, is the deadline for full proposals. The goal of the program is to discover and develop information and tools that can lead to the prevention, detection, monitoring and control of aquatic invasive species. The program seeks especially to support NOAA relevant regional research and outreach priorities identified by the Regional Panels of the Aquatic Nuisance Species Task Force

Conference. 'Invasive Species in Natural Areas - A Conference on Impacts and Management', will be held **February 13-14, 2008**, in Missoula, Montana. The conference focuses on the interface between applied research and management of invasive species in natural areas. University and agency researchers will meet with land managers of the Rocky Mountain States to discuss possibilities and problems specific to management of invasive species in natural areas. They will also discuss the formation of a rocky Mountain Exotic Pest Plant Council. *For more info, contact Mark Schwarzlaender at <markschw@uidaho.edu>* (*Thanks to Clover lockhard, RCO*)

Land-based Ballast Water Treatment. The ballast water of ships entering the Great Lakes could be treated effectively and relatively inexpensively at an on-land treatment plant, according to a study paid for by the Wisconsin Department of Natural Resources. The report, just released this week, used the Port of Milwaukee as an example to show that the time to pump or barge water to an on-land treatment facility wouldn't be prohibitive, and that on-land facilities could be built relatively inexpensively - about $2 million each. While no facility was actually built, a feasibility study was conducted by the Milwaukee-based office of Brown and Caldwell, an environmental engineering and consulting firm. *(From a John Myers article in the Duluth News Tribune, December 06.)*

[Ed note: I attempted to get a title and location for this report but was unable to contact the person at WDNR; keep your eyes open…maybe it will surface soon.]